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ADJUSTABLE OUTPUT RATE CHEMICAL FEEDING EQUIPMENT FOR SWIMMING POOLS. NATIONAL SANITATION FOUNDATION STANDARD NUMBER 19.

NATIONAL SANITATION FOUNDATION, ANN ARBOR, MICH.

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DESCRIPTORS- *EQUIPMENT STANDARDS, *PUBLIC HEALTH, *RECREATIONAL FACILITIES, *SWIMMING POOLS, SANITATION,

THE SCOPE OF THIS STANDARD COVERS ADJUSTABLE OUTPUT RATE CHEMICAL FEEDERS, WHETHER USED FOR SOLUTIONS, SLURRIES OR SOLIDS. IT ALSO INCLUDES AUXILIARY EQUIPMENT SUCH AS PUMPS, STRAINERS, TUBING CONNECTIONS, TANKS, INJECTION FITTINGS AND OTHER REQUIRED COMPONENTS. THE FEEDERS DESCRIBED ARE INTENDED TO BE DESIGNED AND USED SPECIFICALLY FOR CHEMICAL FEEDING FOR BOTH PUBLIC AND PRIVATE RESIDENTIAL SWIMMING POOLS. NOT INCLUDED IN THIS STANDARD ARE GASEOUS FEED EQUIPMENT, FEEDERS WITHOUT ADJUSTABLE OUTPUT RATES, OR FEEDERS WHOSE OUTPUT RATE IS DEPENDENT ON THE FLOW RATE OF THE MEDIUM INTO WHICH THE CHEMICALS ARE INTRODUCED. SECTION 1 INCLUDES---(1) MINIMUM REQUIREMENTS, (2) ALTERNATE MATERIALS, (3) REVIEWS AND REVISIONS, AND (4) VARIATIONS IN DESIGN AND OPERATION. SECTION 2 COVERS DEFINITIONS AND TERMINOLOGY. SECTION 3, SUITABLE MATERIALS, AND SECTION 4, DESIGN AND CONSTRUCTION. (RH)

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NATIONAL SANITATION FOUNDATION

STANDARD NUMBER 19

Relating to

ADJUSTABLE OUTPUT RATE CHEMICAL FEEDING EQUIPMENT

for

SWIMMING POOLS

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Prepared by the

NATIONAL SANITATION FOUNDATION COMMITTEE

FOR

SWIMMING POOL EQUIPMENT STANDARDS

OCTOBER 1966

THE NATIONAL SANITATION FOUNDATION
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THE NATIONAL SANITATION FOUNDATION

PURPOSE

In 1944, a small group of industrial and public health leaders were discussing mutual problems involving sanitation. They realized that modern sanitation problems affecting industry and the public health could be best solved through mutual understanding and cooperative action to produce sound, effective educational programs and to foster public knowledge, rather than through ordinances, inspections and law enforcement alone.

It occurred to them that great strides could result from the creation of an independent but authoritative liaison organization which would be a clearing house through which business, industry and health authorities could work together for the solution of common problems and for the common good.

They realized that through such an organization they could foster the research and educational programs so essential to keeping abreast of the technological advances of industry, with modern products and services, and with the daily lives of the people.

Thus was born the National Sanitation Foundation with Headquarters in the School of Public Health of the University of Michigan at Ann Arbor, Michigan.

The National Sanitation Foundation is a non-commercial, non-profit, organization seeking solutions to all problems involving cleanliness and sanitation. It is dedicated to the prevention of illness, the promotion of health and the enrichment of the quality of American living through pre-planning of preventative programs for the improvement of the environment.

The National Sanitation Foundation fulfills the important purpose of arranging for a common meeting ground where industry and public health may discuss and solve common problems.

PROGRAM

The program of the National Sanitation Foundation charted in 1948 at the National Sanitation Clinic, by some 500 of the nation's leading public health authorities and business and industrialists encompasses the following basic areas of activity:

BASIC AND APPLIED RESEARCH: The need for an enlarged research program in the field of environment was recognized by the Clinic as pressing. Many problems and uncertainties are currently answered by a multiplicity of curbstone opinion. Only through seeking out and defining the answers thereto, can sanitation attain the status it deserves.

STANDARDS: The need for uniform equipment standards was pointed out by both industry and public health groups. Seven National Sanitation Foundation Stan dards have been developed, and additional Standards are in various stages of completion. These Standards, based on scientific fact, have been developed on a cooperative basis by representatives of industry and professional public health officials, and are the result of comprehensive study and review by all concerned groups.

TESTING LABORATORY: The need for an independent testing laboratory where applied research relative to sanitation methods, materials and equipment, could be conducted objectively, had been expressed many times by industry and public health. The 1948 Clinic emphasized that such a laboratory, where tests may be made, and, when merited, approval given, would serve as a valuable contribution to the improvement of environment throughout the country. The National Sanitation Foundation Testing Laboratory was established in 1952 to fulfill this need, and serves both industry and public health sanitation interests.

SEAL OF APPROVAL: A Seal of Approval, or some means of identifying items of equipment or devices meeting high public health standards was specified, by the Clinic, to be an urgent need. Following the establishment of the National Sanitation Foundation Testing Laboratory, an official Seal of Approval was adopted and may be authorized for use by industry, on equipment found to conform with National Sanitation Foundation Standards. A continuing program of evaluation for equipment, devices or products authorized to bear the Seal and annual renewal of the authorization is required.

EDUCATION: Only through an adequate program of education is it possible to translate the results of research to health officials, business and the public. THE AMERICAN INSTITUTE OF ENVIRONMENT was formed for expressed purpose of implementing and conduction basic and applied research activities in the fields of education, methodology, working relationships and communications between the public, industry, academic interests, professional public health workers and official agencies.

PREFACE

This Standard, covering Recessed Automatic Surface Skimmers is one series of NSF Standards for Swimming Pool Equipment. These Standards are being developed and issued in recognition of the need for a common understanding of the problems of sanitation involving industry and administrative health officials whose obligation it is to enforce regulations.

This Standard is the result of considerable study on the part of public health officials, consultations with technical representatives of industry, and investigations of the National Sanitation Foundation's staff. The improvement of environmental health and sanitation and the establishment of uniform requirements have been the primary aim in the preparation of this Standard. However, it is recognized that continued technicological progress will require periodic changes.

The adoption of these Standards offers health officials an opportunity to present a united front in securing the basic equipment necessary for the safe and efficient operation of swimming pools, private or public. It gives users of such filters the assurance of meeting health standards and of satisfactory performance when properly operated. Also, they give manufacturers the advantage of applying uniform design and construction methods with confidence that equipment conscientiously built to meet these Standards will be generally acceptable.

Finally, as an aid to all concerned in recognizing approved equipment, the National Sanitation Foundation Testing Laboratory has established a program under which the use of its insigne, nSf, can be authorized on skimmers that meet the requirements herein established for Recessed Automatic Surface Skimmers.

Permission to use the National Sanitation Foundation Testing Laboratory's Seal of Approval is granted only after evaluation of the applicant's manufacturing methods and performance testing of his filters, shows compliance with the Standard. Continuance of the use of the nSf Seal of Approval is dependent upon continued evidence of compliance with the Standard upon periodic re-evaluation of equipment in factory and field.

Sincere appreciation is extended to all members of the Committees herein listed who so willingly devoted their time to the development of this and other Standards. Special credit and thanks are due the members of the Subcommittee for

Recessed Automatic Surface Skimmers and of the NSF Committee for Swimming Pool Equipment Standards for the long hours spent in review, discussion and correspondence, as well as to the Industry Advisory Committee for its untiring efforts in this work.

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NATIONAL SANITATION FOUNDATION SWIMMING POOL EQUIPMENT STANDARDS*

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SUGGESTIONS CONCERNING REGULATIONS

GOVERNING

ADJUSTABLE OUTPUT RATE CHEMICAL FEEDING EQUIPMENT

It is strongly recommended that these Standards representing a cross-section of opinion of workers in the field of environmental health be accepted and followed by enforcement officials. However, their incorporation in detail into local sanitary codes does not appear to be necessary and is likely to be cumbersome.

In municipalities, counties, and health districts in which the adoption of legislation by reference is considered legal, the following regulation should serve to implement the use of the Standard for Adjustable Output Rate Chemical Feeding Equipment.

> ALL ADJUSTABLE OUTPUT RATE CHEMICAL FEEDING EQUIPMENT INSTALLED ON OR AFTER _____ IN PUBLIC OR PRIVATE SWIMMING POOLS IN THIS JURISDICTION SHALL MEET THE NATIONAL SANITATION FOUNDATION STANDARDS FOR SUCH EQUIPMENT.

or, if considered desirable, it will be simpler to adopt the following or general regulation applying to all standards in the swimming pool equipment field:

> ALL SWIMMING POOL EQUIPMENT INSTALLED ON OR AFTER _____ FOR USE IN PUBLIC OR PRIVATE SWIMMING POOLS IN THE JURISDICTION SHALL MEET THE APPLICABLE NATIONAL SANITATION FOUNDATION STANDARDS.

In fact, the adoption of this broad regulation will save time as well as advertising and printing costs, as no doubt, many different standards will be adopted. Otherwise, each standard will require the adoption of a specific regulation.

Wherever, the legality of adopting legislation by reference is not recognized, delete the portion of either of the above regulations after the word "SHALL" and substitute therefore the words "BE OF A TYPE APPROVED BY THE HEALTH OFFICER." The health officer may be guided by the National Sanitation Foundation Standards in his approval of types.

ADJUSTABLE OUTPUT RATE CHEMICAL FEEDING EQUIPMENT

SECTION 1. - GENERAL

1.00 SCOPE: This standard covers adjustable output rate chemical feeders whether used for solutions, slurries or solids. It also includes auxiliary equipment such as pumps, strainers, tubing connections, tanks, injection fittings and other required components. The feeders herein described are intended to be designed and used specifically for chemical feeding for both public and private residential swimming pools. Not included in this standard are gaseous feed equipment, feeders without adjustable output rates, or feeders whose output rate is dependent on the flow rate of the medium into which the chemicals are introduced.

1.01 MINIMUM REQUIREMENTS: These standards are established as a guide to the evaluation of equipment covered herein and are considered to be basic and minimum requirements. Variations are permissable when they tend to make the equipment more resistant to corrosion, wear and physical damage, or if they improve the general operation and performance of the device.

1.02 ALTERNATE MATERIALS: Where specific materials are mentioned it is understood that the use of other materials proved to be qually satisfactory for the intended end-use will be acceptable.

1.03 REVIEWS AND REVISIONS: After printed publication of this standard, complete review of the standard shall be conducted at intervals of not more than three years to determine what changes, deletions or additions, if any, are necessary to maintain current and effective requirements consistent with new technology and progress. These reviews shall be conducted by appropriate representatives from the public health, industry and user groups. Final adoption of revisions shall be in accordance with the procedures established by the National Sanitation Foundation Committee for Swimming Pool Equipment Standards.

1.04 VARIATIONS IN DESIGN & OPERATION: A feeder varying in principle of design and/or operation from those set forth herein may qualify under the provisions of this Standard provided appropriate tests and investigations indicate that said feeder produces filter cycles, control, accurracy, performance, operation and service at least equivalent to those produced by equipment complying with this Standard. Such feeders shall meet the requirements for materials, finishes and construction in this Stnadard.

SECTION 2. DEFINITIONS

2.00 APPROVED: Found acceptable for the specific use as determined by the National Sanitation Foundation when related to the use of the nSf Seal of Approval.

2.01 TOXIC: Toxic shall mean adverse physiological effect on man.

2.02 POSITIVE DISPLACEMENT: Mechanical displacement of a volume of fluid.

2.03 RESISTANT: Resistant shall mean the properties of a material to withstand chemical reaction and mechanical erosion.

2.04 OUTPUT RATE: Volume of solution or slurries in U.S. gallons, or weight of chemicals in ounces, delivered by the feeder into the medium per 24 hours at pressures and suction lift in accordance with the manufacturer's specifications. Output rates must be independent of the flow rate of the medium into which the chemicals are introduced.

2.05 FEED RATE INDICATOR: A mechanism calibrated directly or with reference to a chart to provide points of reference to permit reproducible setting of output rate.

SECTION 3. MATERIALS

3.00 GENERAL: Any suitable material may be employed that will meet the requirement of resistance, pressure, normal handling and shipping as outlined herein and that will not produce any toxic effect or impart undesirable tastes, odors or color to the pool water.

3.001 No material used in the portion of the feeder which is exposed to the chemical being fed shall contribute toxic, obnoxious or deleterious substances to such chemicals. All plastic materials in contact with the chemical being fed shall meet the applicable standards of the National Sanitation Foundation.

3.01 CHEMICAL RESISTANCE: Feeders shall be resistant to at least the following solutions 12 1/2% sodium hypochlorite, 2% calcium hypochlorite, 12% aluminum sulphate, 10% hydrochloric acid, 10% sodium hydroxide and 5% sodium carbonate. Equipment furnished for dispensing these and/or other chemical solutions shall be designed and equipped to meet the resistance test specified in 3.011.

3.011 RESISTANCE TEST: Normally wetted parts of the feeder shall be exposed to the above solutions for a period of 100 days at 73°F. The feeder shall then be operated for a period of 24 hours under maximum use conditions, and meet the standard specified in Section 4.011.

3.02 ERROSION RESISTANCE:

Feeders offered for feeding slurries or other abrasive materials ahall be resistant to 5% diatomaceous earth slurry or 1% light weight expanded volcanic filter media when tested under conditions of Item 3.021.

Feeders designed for feeding dry chemicals shall be resistant to the chemical in its dry form under the test conditions of Item 3.022.

3.021 RESISTANCE TEST - SLURRY FEEDERS:

The feeder shall feed at maximum output setting, an agitated suspension of 5% diatomaceous earth for a period of 2500 hours continuously against 20 psi back pressure. During this period it shall feed in total no less than 80% of its net rated output. It must also feed no less than 80% of its rated output during the last hour of this test. Upon disassembly, none of the normally wetted parts shall show errosion sufficient to render it inoperative. Maintenance according to the manufacturer's standard instructions, with the exception of parts replacement, shall be carried out during the test period.

3.022 RESISTANCE TEST - DRY FEEDER:

The Feeder shall feed at maximum output settings, the dry chemical compound for which the feeder is intended for a period of 2500 hours continuously into atmospheric pressure. During this period, it shall feed in total no less than 80% of its net rated output. It must also feed no less than 80% of its rated output during the last hour of this test. Upon disassembly, anne of the parts of the feeder normally contacted by the chemical being fed shall show errosion sufficient to render it inoperative. Maintenance according to the manufacturer's standard instructions, with the exception of parts replacement, shall be carried out during the test period.

SECTION 4. DESIGN AND CONSTRUCTION

4.00 GENERAL: The feeder shall be capable of being easily disassembled for cleaning and maintenance. The design and construction shall be such as to minimize stoppage from chemicals intended to be used therein or from foreign materials that may be contained in said chemicals. The feeder shall be designed so that when properly installed it will prevent uncontrolled siphonage or discharge of chemicals directly into the swimming pool, the pool piping system or the water supply system.

4.01 FEEDER OUTPUT RATE: The feeder output rate shall be adjustable in not less than 5 increments over the full operating range. Means for regulating shall be conveniently located when mounted in accordance with the manufacturer's instructions.

4.011 Feeders shall deliver chemicals in slurries, solutions, or in solid form into the medium at the output rate shown by the feed rate indicator, plus or minus 10% of the setting, over a range of deliveries varying from 25% to 100% of rated capacity and where applicable over a range of delivery pressures of from 10" Hg. vacuum to the maximum specified by the manufacturer, but not to exceed 50 psig.

4.02 PRESSURE REQUIREMENTS: Feeders shall pass a hydrostatic pressure test equal to 1 1/2 times the manufacturer's maximum pressure rating applied to all parts of the feeder which will be subject to discharge pressures when in operation.

4.03 LIFE TEST: Feeders shall be capable of operating 3000 continuous hours at 80% of maximum pressure and output rate as specified by the manufacturer. Tests shall be conducted on three sample feeders. At least one sample must complete 3000 hours and at least 8000 satisfactory operation hours must be accumulated among the three samples. All tests carried out in an ambient room at 100°F. Maintenance according to the manufacturer's standard instructions with exception of part replacement shall be carried out during the test period.

4.04 FEEDER HOUSING: The feeder housing and other components shall have sufficient structural strength and durability to withstand normal stresses incindental to shipping, installation and operation.

4.05 SAFETY: Moving parts of the feeder must be covered where the possibility of injury to an operator or attendant exists.

4.06 PROVISIONS FOR MOUNTING: The feeder shall be designed and constructed to facilitate secure mounting.

4.07 MOTORS: All motors shall be constructed electrically and mechanically so that they will perform satisfactorily and safely under the conditions of load and environment normally ecnountered in swimming pool installations. They shall be of the continuous duty type and where NEMA Standards exist, shall conform thereto. Standard voltages and cycles shall be used and full service factors as provided for by NEMA for each size motor shall be maintained. All motors shall be U.L. approved.

4.08 SUCTION LIFT: After priming positive displacement pump type feeders shall perform satisfactorily with a suction lift of four (4) feet of water.

4.09 OPERATION AND INSTALLATIONS INSTRUCTIONS: There shall be furnished with each feeder, drawings, and parts lists for easy identification and ordering of replacement parts. Also, included shall be a statement of manufacturer's guarantee. Instructions for porper installation, operation and maintenance shall be included. Instructions shall include reference to flooded suction installations and prevention of cross connections.

4.10 DATA PLATE:

4.101 TYPE AND LOCATION: Data plates shall be of permanent nature, so inscribed as to be easily read and understood, and securely attached, cast or stamped into the feeder at a location readily accessible after normal installation.

4.102 CONTENTS: Data plates shall contain the following information:
(1) Manufacturer's or prime suppliers' name and address

(2) Feeder model number and/or serial number

(3) Maximum operating pressure rating (psig)

(4) Maximum output rating (volume of liquid or weight or volume of solid chemicals per 24 hour day)